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10/664,566	09/17/2003	James W. Iseli	IO-1096	4584
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PAUL S MADAN MADAN, MOSSMAN & SRIRAM, PC 2603 AUGUSTA, SUITE 700 HOUSTON, TX 77057-1130			HUGHES, SCOTT A	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/664,566

Applicant(s)

ISELI, JAMES W.

Examiner

Scott A. Hughes

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26, 61-63 and 69-79 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26, 61-63 and 69-79 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/21/2007 have been fully considered but they are not persuasive.

With regard to claim 69, applicant argues that Orban does not teach or suggest a separate recording device for each sensor or a wireless transmission of data. Applicant argues that the only data stored in the device of Orban is "calibration coefficients." Applicant argues that the seismic signals are sent through a data bus to further recording units. This argument is not persuasive because the claim does not state that the seismic signals must be stored in the device. The claim limitation states that the recorder must record and store "seismic information corresponding to a selected sensing location from the plurality of sensing locations." The Orban reference records signals from the sensors and also stores seismic information in the form of the coefficients. The term "seismic information" is a broad limitation, and the stored coefficients in Orban are stored seismic information since they are information relating to the seismic survey.

Applicant argues that the Orban reference teaches only a wired cable system, and does not teach the use of wireless transmission. Although the Orban reference teaches only cabled systems, it is well known in the art to use wireless communications between a central controller and devices in a seismic survey network (see US patents 5706250, 4725992).

With regard to claim 70, applicant makes the same arguments addressed above.

With regard to claim 71, applicant argues that the Wood reference provides a GPS unit that provides the location of the sensor station unit to which it is attached. Applicant argues that the sensors can be separated from the GPS by lead-ins of up to 50 meters in length. Applicant argues that the Wood reference therefore does not provide meaningful information as to the location of a given sensor unit. These arguments are not persuasive because the claim limitation is broad and does not specifically state what type of information must be included in the location parameter, and therefore any information related to a position of the sensors relative to the seismic survey meets the claim limitation. Since the GPS receiver in Wood gives the location for the sensor station to which the sensor is attached, it has provided a location parameter for the sensor. Applicant argues that amended claim 71 recites one sensor unit, a location sensor that provides a location parameter for the one sensor unit, and an acquisition device receiving seismic signals from only one sensor unit, and a memory device that stores the location parameter for the one sensor unit. Applicant argues that the Wood reference teaches multiple sensors attached to each acquisition device, and argues that the Wood reference therefore does not meet the claim limitations. This argument is not persuasive as applicant's claim states "An apparatus for seismic data acquisition comprising." The term "comprising" is open-ended and requires a minimum of the claimed structure to be present while allowing for additional, non-claimed structure to also be present. Therefore, as long as the Wood reference teaches one sensor attached to the acquisition device, it meets the claim language even if there are additional sensors also attached. As seen in Fig. 2 of Wood, there is one sensor

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attached to the acquisition device, and therefore Wood still reads on the claim language.

With respect to claims 1-13, 15-26, 61 and 63, applicant argues that there is not a motivation to combine the Tanenhaus and Orban references. Applicant argues that the principles of operating the systems of Orban and Tanenhaus are distinct and incompatible. Applicant states that the Tanenhaus device is a single, autonomous unit, while the Orban system has sensors remote from recording units. Applicant argues that Tanenhaus uses the devices to remotely monitor, while Orban does not remotely monitor the sensor. This argument is not persuasive because both Tanenhaus and Orban have multiple sensors in an area that relay data to a central recording and processing area (computer 50 in Tanenhaus and seismic network in Orban). Further, Orban remotely monitors the sensors in that the sensors send their data to a remote location for processing. Applicant states that combining Tanenhaus with Orban would deprive Tanenhaus of its stated purpose of remote monitoring. This argument is not persuasive the teaching from Orban was not modifying the structure or the way in which data is relayed in the Tanenhaus reference. Orban was cited to teach that one method of collecting seismic data is to collect seismic data to image a subsurface formation. The Tanenhaus reference taught monitoring seismic signals, but did not disclose the specifics of monitoring reflected seismic energy to image a subsurface. Using the teaching of Orban to monitor a subsurface formation with seismic data does not require that the actual structure or data collection of Tanenhaus be modified as implied by applicant is the arguments as to why the two references can not be combined.

Applicant appears to be arguing the combination of the two references in their entirety and not the teachings, combination, and motivation to combine cited in the prior Office Action.

With respect to claim 1, applicant argues that the amendment adding that the transmission is wireless transmission and that the location sensor is connected to the acquisition device further distinguish claim 1 from the prior art. This argument is not persuasive because Tanenhaus discloses wireless communication between the acquisition device and a remotely located central controller 50 (Fig. 1) (Column 8). Tanenhaus also discloses that the location sensor is connected to the acquisition device (Column 8).

With respect to claims 2 and 3, applicant's amendments to the claims add new limitations that have been determined to be new matter, as the common housing, sensor housing, and first and second housing limitations added to not have support in the specification. The closest support in the specification shows a sensor that is separate from a housing (Figs. 3a,3b; [0043]), but does not show first and second housings or a common housing and sensor housing.

With respect to claims 4-15 and 17-26, applicant states that these claims depend from claim 1, which applicant believes to be in condition for allowance. Since claim 1 is not in condition for allowance as discussed above, these claims are also rejected as described in the prior Office Action.

With regard to claim 16, applicant argues that Tanenhaus does not teach a remotely located controller being programmed to control seismic data acquisition for

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imaging a subsurface formation. This argument is not persuasive because Orban teaches the missing limitations related to having a central controller used for controlling seismic data acquisition for subsurface imaging.

With regard to claim 61, applicant argues that Tanenhaus does not teach a central controller controlling an array for acquiring seismic data. This argument is not persuasive because Tanenhaus discloses a central controller 50 (Column 8) that controls the data from and sends commands to an array of sensor nodes 20. Although Tanenhaus does not disclose that the seismic information is related to a subsurface formation, this limitation is obvious in view of the teachings of Orban as discussed above.

Applicant argues that claims 14 and 62 are patentable because Tanenhaus cannot be combined with Orban as argued above. Since this argument was addressed above and found not persuasive, claims 14 and 62 are still deemed to be rejected.

Claim Objections

Claim 71 is objected to because of the following informalities:

Claim 71 recites the limitation of an "acquisition device co-located with the sensor unit and **receiving seismic signals** from only the one sensor unit **for receiving the signal** and the location parameter." It appears that the claim recites the limitation of receiving the signal twice. If applicant is meaning for there to be two different received signals, it is unclear what the second received signal would be. Appropriate correction

is required. For the purpose of this action, it will be assumed that both received signals are the seismic signals and that the limitations are duplicate limitations.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2 and 3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant's amendments to the claims add new limitations that have been determined to be new matter, as the common housing, sensor housing, and first and second housing limitations added to not have support in the specification. The closest support in the specification shows a sensor that is separate from a housing (Figs. 3a, 3b; [0043]), but does not show first and second housings or a common housing and sensor housing.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 70 is rejected under 35 U.S.C. 102(e) as being anticipated by Orban (6353577).

With regard to claim 70, Orban discloses an apparatus for imaging of a subsurface formation (abstract, Column 1). Orban discloses a plurality of sensors disposed to form a seismic spread having a plurality of sensing locations, the seismic spread being proximate to a subsurface formation of interest to sense seismic energy imparted into the subsurface formation and generate responsive signals (Column 1, Lines 1-50; Column 1, Line 51 to Column 2, Line 15; Column 3, Lines 29-67). Orban discloses a plurality of recorders, each of the plurality of recorders co-located with one sensor and recording and storing in digital form seismic information corresponding to a selected sensing location from the plurality of sensing locations, the seismic information being in a form for seismic imaging of the subsurface formation (Column 1; Column 3, Line 29 to Column 4, Line 57). Orban discloses a location sensor $58_{x,y,z}$ associated with each of the plurality of recorders providing a location parameter to be correlated with the acquired seismic data (Column 5, Line 20 to Column 6, Line 24).

Claim 71 is rejected under 35 U.S.C. 102(e) as being anticipated by Wood (5724241)

With regard to claim 71, Wood discloses one sensor unit 20 (Figs. 1-2) for sensing seismic energy, the one sensor unit providing a signal indicative of the sensed seismic energy, the one sensor unit being positioned over a subsurface formation of interest to sense seismic energy imparted into the subsurface formation and generate signals indicative of the seismic energy sensed from one selected location (Column 4, Line 50 to Column 5, Line 17; Column 5, Line 50 to Column 6, Line 49). Wood discloses a location sensor providing a location parameter for the one sensor unit (abstract; Column 6; Column 7, Lines 24-60). Wood discloses an acquisition device 10 co-located with the sensor unit and receiving seismic signals from only the one sensor unit for receiving the signal and the location parameter (Figs. 1-2) (abstract; Column 4, Line 50 to Column 5, Line 17; Column 5, Line 50 to Column 6, Line 49; Column 7). Wood discloses a memory unit disposed in the acquisition device for storing information indicative of the received signal and storing the location parameter for only the sensor unit (Column 7, Lines 1-60). Wood discloses a direct-conversion radio transceiver for providing communication between the acquisition device and a remotely located central controller 16 (Fig. 1) (Column 5, Line 50 to Column 6, Line 25; Column 8, Line 20 to Column 9, Line 30) (Table – Columns 8-9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-13, 15-26, 61, 63, 72-75, and 78-79 are rejected under 35

U.S.C. 103(a) as being unpatentable over Tanenhaus (6255962) in view of Orban (6353577).

With regard to claim 1, Tanenhaus discloses an apparatus for seismic data acquisition (Column 4, Lines 10-31). Tanenhaus discloses a sensor unit for sensing seismic energy, the sensor unit providing a signal indicative of seismic energy sensed by the sensor unit (Column 2; Column 4, Lines 10-45; Columns 5-6). Tanenhaus discloses an acquisition device co-located with the sensor unit and coupled thereto for receiving the signal (Figs. 1, 8-9) (abstract; Column 2; Column 5, Line 10 to Column 6). Tanenhaus discloses a location sensor associated with the acquisition device and residing in the acquisition device (Column 8, Lines 43-60). Tanenhaus discloses a memory unit having a first memory disposed in the acquisition device for storing in digital form information indicative of the received signal (Column 6, Lines 1-8; Column 6, Lines 55-65; Column 9). Tanenhaus discloses a second memory for storing a location parameter associated with the sensor unit (Column 8, Lines 50-60). Tanenhaus discloses a communication device for providing direct wireless bi-directional communication between the acquisition device and a remotely located central controller (abstract; Column 7; Column 8, Lines 1-10, 26-43; Column 9) (Fig. 1, Fig. 9). Tanenhaus does not disclose that the apparatus is used in characterizing a subsurface formation. Tanenhaus discloses a device with sensors that for seismic data, but does not disclose these sensors being used to sense seismic data to characterize a

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subsurface formation. Tanenhaus does not disclose coupling the seismic sensors to the earth and sensing seismic energy imparted into a subsurface formation and providing a signal indicative of seismic energy reflected from the subsurface formation and suitable for imaging the subsurface formation. Tanenhaus discloses a device that senses seismic data with sensors such as accelerometers, but does not disclose using the device in the environment of sensing data imparted into a subsurface formation.

Orban teaches a device that includes circuitry and seismic sensors (abstract; Column 1). Orban teaches coupling the device to the earth's surface above a subsurface formation and using the acquired seismic data to characterize the subsurface formation (Column 1, Lines 1-15; Column 3, Line 1 to Column 4, Line 58). It would have been obvious to modify Tanenhaus to include coupling the device to the earth's surface and using the seismic sensors to sense energy reflected from the subsurface to image the subsurface as taught by Orban in order to obtain seismic data that is useful as information about subsurface stratigraphy in a given area.

The "for sensing," "suitable for imaging," "for storing," and "for providing" clauses are essentially method limitations or statements of intended or desired use. Thus, these claims as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference. See In re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 512 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP § 2114 which states:

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A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The limitation "the location parameter being processed with the acquired seismic data" limitation in claim 1 is a recitation to a material or article worked upon, and does not limit the apparatus claim (See MPEP 2115).

This limitation is also a method limitation that does not further the apparatus since it does not limit the structure of the apparatus being claimed.

With regard to claim 4, Tanenhaus discloses that the sensor unit includes a velocity sensor (Column 4, Lines 10-45).

With regard to claim 5, Tanenhaus discloses that the sensor includes an accelerometer (Column 4, Lines 10-45).

With regard to claim 6, Tanenhaus discloses that the sensor unit includes a multi-component sensor (Column 4, Lines 10-45).

With regard to claim 7, Tanenhaus discloses that the sensor unit has a multi-component accelerometer having a digital output signal (Column 4, Lines 10-45; Column 5).

With regard to claim 8, Tanenhaus discloses an analog to digital converter disposed in the sensor unit, the signal provided by the sensor unit including a digital signal (Column 2; Column 5).

With regard to claim 9, Tanenhaus discloses that the signal is an analog signal, the apparatus further comprising an analog-to-digital converter disposed in the acquisition device for converting the signal to digital data (Column 2, Column 5).

With regard to claim 10, Tanenhaus discloses that the first memory is a nonvolatile memory (Column 6, Lines 55-65).

With regard to claim 11, Tanenhaus discloses that the first memory comprises a removable memory (Column 6, Lines 55-65). Flash memory is known to be removable.

With regard to claim 12, Tanenhaus discloses that the first memory comprises a nonvolatile removable memory card (Column 5, Lines 55-65).

With regard to claim 13, Tanenhaus discloses that the memory unit includes an inductive coupling device for transferring the information stored in the memory unit to an external device (Column 7; Column 8, Lines 1-10, 25-60).

With regard to claim 15, Tanenhaus discloses that the sensor unit is coupled to the acquisition device using a sensor connector, the memory unit also being coupled to the sensor connector for enabling retrieval of the information stored in the memory unit using the sensor connector (Figs. 1, 6-9). All of the components are connected together by circuitry that is read as being a sensor connector. The sensors, processors, and memory are all connected together inside of the acquisition device.

With regard to claim 16, Tanenhaus discloses that communication with the central controller provides wireless command and control for the apparatus (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9). Tanenhaus does not disclose that the central controller is programmed to control seismic data acquisition for imaging a subsurface formation. Tanenhaus discloses a device that senses seismic data with sensors such as accelerometers, but does not disclose using the device in the environment of sensing data imparted into a subsurface formation. Orban teaches a device that includes circuitry and seismic sensors and a central controller (abstract; Column 1). Orban teaches coupling the device to the earth's surface above a subsurface formation and using the acquired seismic data to characterize the subsurface formation, wherein the devices used in the survey are controlled by a central controller (Column 1, Lines 1-15; Column 3, Line 1 to Column 4, Line 58). It would have been obvious to modify Tanenhaus to use the central controller to control the acquisition devices and the seismic sensors to sense energy reflected from the subsurface to image the subsurface as taught by Orban in order to obtain seismic data that is useful as information about subsurface stratigraphy in a given area.

With regard to claim 17, Tanenhaus discloses a processor associated with the acquisition unit and the communication device, the processor processing programmed instructions enabling a software defined radio transceiver (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9).

With regard to claim 18, Tanenhaus discloses that the communication device includes a direct conversion radio transceiver for wireless communication between the

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apparatus and the remotely located central controller (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9).

With regard to claim 19, Tanenhaus discloses a processor in the acquisition unit for providing one or more of local control, time keeping, or power management (Column 7; Column 6, Line 65 to Column 7, Line 12).

With regard to claim 20, Tanenhaus discloses a power source disposed in the acquisition device for providing electrical power to one or more of the acquisition device, the sensor unit, and the communication device (Column 7).

With regard to claim 21, Tanenhaus discloses that the power source is removable (Column 7, Lines 29-63).

With regard to claim 22, Tanenhaus discloses that the power source is a rechargeable battery (Column 7, Lines 29-63).

With regard to claim 23, Tanenhaus discloses an inductive coupling in the acquisition device, the inductive coupling being operably coupled to the rechargeable battery to allow charging of the rechargeable battery by a second power source external to the acquisition device (Column 7, Lines 29-63).

With regard to claim 24, Tanenhaus discloses a connector disposed in the data acquisition device, the connector being operably coupled to the rechargeable battery to allow charging of the battery by the external power device (Column 7, Lines 29-63).

With regard to claim 25, Tanenhaus discloses that the rechargeable battery is a lithium based battery (Column 7, Lines 29-63).

With regard to claim 26, Tanenhaus discloses a GPS receiver associated with the sensor unit for determining the location parameter (Column 8, Lines 50-60).

With regard to claim 61, Tanenhaus discloses a system for seismic surveying to characterize a subsurface formation. Tanenhaus discloses a central controller 50 (Fig. 1), an array for acquiring seismic data being controlled by the central controller (Column 4, Lines 10-36, Column 7, Line 13 to Column 8, Line 42; Column 9, Line 10-41); with the array including at least one acquisition device comprising: a sensor unit 20 remotely located from the central controller, the sensor unit coupled to the earth for sensing seismic energy in the earth and for providing a signal indicative of the seismic energy reflected from the subsurface formation (Column 2; Column 4, Lines 10-45; Columns 5-6); a recorder device co-located with the sensor unit and coupled thereto for receiving the signal and for storing in digital form information indicative of the received signal in a first memory disposed in the recorder device (Figs. 1, 6-9) (Column 2; Column 4, Lines 10-65; Column 5; Column 6, Lines 42-65; Column 9); an acquisition device processor in communication with the sensor unit and the recorder device (Column 6); a location sensor communicating with only the processor, wherein the processor, the sensor unit, the recorder device, and the location sensor form a single sensor station (Column 6, Line 1 to Column 8, Lines 43-60) (Fig. 1); a second memory for storing a location parameter associated with the sensor unit (Column 8, Lines 50-60); and a communication device co-located with the sensor unit and the recorder device for providing wireless bi-directional communication with the central controller (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9). Tanenhaus discloses that

communication with the central controller provides wireless command and control for the apparatus (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9).

Tanenhaus does not disclose that the central controller is programmed to control seismic data acquisition for imaging a subsurface formation. Tanenhaus discloses an array controlled by a central controller that senses seismic data with sensors such as accelerometers, but does not disclose using the device in the environment of sensing data imparted into a subsurface formation. Orban teaches a device that includes circuitry and seismic sensors and a central controller (abstract; Column 1). Orban teaches coupling the device to the earth's surface above a subsurface formation and using the acquired seismic data to characterize the subsurface formation, wherein the devices used in the survey are controlled by a central controller (Column 1, Lines 1-15; Column 3, Line 1 to Column 4, Line 58). It would have been obvious to modify Tanenhaus to use the central controller to control the acquisition devices and the seismic sensors to sense energy reflected from the subsurface to image the subsurface as taught by Orban in order to obtain seismic data that is useful as information about subsurface stratigraphy in a given area.

The "for seismic surveying," "for sensing seismic energy," "for providing signal," "for receiving," and "for storing" clauses are essentially method limitations or statements of intended or desired use. Thus, these claims as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference. See In re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re

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Finsterwalder, 168 USPQ 530; In re Casey, 512 USPQ 235; In re Otto, 136 USPQ 458;

Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP § 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

With regard to claim 63, Tanenhaus discloses that the communication device includes a two-way wireless transceiver for wireless communication with the central controller (Columns 7-8).

With regard to claims 72-75, Tanenhaus and Orban teach that the acquisition units are configured to receive location parameters entered by a field crew through the use of GPS or magnetometers/accelerometers. The two references teach that these location parameters include longitude and latitude (GPS data from Tanenhaus) and inclination and azimuth (from accelerometer/magnetometer data in Orban) (Tanenhaus - Column 8; Orban - Columns 5-6).

With regard to claim 78, Tanenhaus teaches a processor programmed to process the location parameter with the acquired seismic data (Columns 8-9).

With regard to claim 79, Orban teaches that the subsurface formation data acquired in the survey are characterized by a characterization processor (Column 1).

Claims 14 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanenhaus in view of Orban as applied to claims 1-13 and 61 above, and further in view of Rialan (5276655).

With regard to claim 14, Tanenhaus does not disclose that the memory unit includes an optical coupling device for transferring the information stored in the memory unit to an external device. Rialan discloses a seismic survey system wherein the data is transferred from a memory unit to an external device by means of optical coupling device (Column 5). It would have been obvious to modify Tanenhaus to include an optical coupling device as taught by Rialan in order to transfer the data directly from one device to another without the operator of the devices having to leave the measuring space or without the receiver needing to be taken to another place to retrieve the data from it.

With regard to claim 62, Tanenhaus does not disclose an energy source for providing the seismic energy to the earth. Rialan discloses a seismic energy source S (Fig. 1) on the surface of the earth to provide seismic energy. It would have been obvious to modify Tanenhaus to include a seismic source in order to generate the seismic waves that can be recorded by the seismic sensors inside of the sensing device to obtain a seismic survey of an area.

Claim 69 is rejected under 35 U.S.C. 103(a) as being unpatentable Over Orban (6353577) in view of McNatt (4725992).

With regard to claim 69, Orban discloses a system for seismic data acquisition. Orban discloses a central controller (Column 1, Lines 1-15; Column 2, Lines 10-25; Column 3, Lines 29-40; Column 4, Lines 1-23). Orban discloses a plurality of sensors disposed to form a seismic spread having a plurality of sensing locations, the seismic spread being proximate to a subsurface formation of interest and generating signals indicative of the sensed seismic energy (Column 1, Lines 1-50; Column 1, Line 51 to Column 2, Line 15; Column 3, Lines 29-67). Orban discloses a separate recorder co-located with each sensor recording and storing seismic information corresponding to a selected sensing location from the plurality of sensing locations (Column 4, Lines 10-53). Orban discloses a separate processor co-located with each sensor, each processor being in bi-directional communication with the central controller (Column 2; Column 3, Lines 29-40; Column 4, lines 10-57). Orban discloses a location sensor 58x,y,z associated with each recorder providing a location parameter, the location parameter being correlated with the acquired seismic data to image the subsurface formation (Column 5, Line 20 to Column 6, Line 24). Orban does not disclose that the processor is in wireless communication with the central controller. Orban discloses communicating over a wire. McNatt teaches using wireless communication between a central control unit K and field units 401-416 in a seismic survey by means of radio communications (Columns 7-8). It would have been obvious to modify Orban to use wireless radio communication as taught by McNatt instead of communication through a cable in order to be able to relocate the acquisition devices during the survey without having to move wires.

The limitation "the location parameter being correlated with the acquired seismic data" limitation in claim 69 is a recitation to a material or article worked upon, and does not limit the apparatus claim (See MPEP 2115).

This limitation is also a method limitation that does not further the apparatus since it does not limit the structure of the apparatus being claimed.

Claims 76-77 are rejected under 35 U.S.C. 103(a) as being unpatentable Over Tanenhaus in view of Orban as applied to claim 61 above, and further in view of McNatt (4725992).

With regard to claims 76-77, Tanenhaus and Orban do not teach that the central controller receives a system parameter relating to the apparatus, the system parameter being an adjusted location parameter. Tanenhaus and Orban do not teach that the adjusted location parameter is related to a predetermined location spread. McNatt teaches updating the positions of devices during a seismic survey and teaches that the updated (adjusted) location parameters of the devices are related to a predetermined location spread (Column 5, Line 40 to Column 6, Line 40; Column 7, Line 25 to Column 8, Line 21). It would have been obvious to modify Tanenhaus and Orban to include using an adjusted location parameter as taught by McNatt in order to be able to rearrange the locations of the devices during a seismic survey to cover a large survey area.

Conclusion

The cited prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

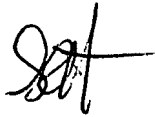
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A. Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3663

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SAH



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